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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/593,771 | 09/22/2006 | Yuzuru Takamura | 1422-0724PUS1 | 9086 |
| 2292 7590 04/09/2010 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747 | | | | |
| EXAMINER | | | | |
| PAIK, SANG YEOP | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 3742 | | | | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/593,771

Applicant(s)

TAKAMURA ET AL.

Examiner

SANG Y. PAIK

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S509)
Paper No(s)/Mail Date 12/22/06, 9/22/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements filed 12/22/06 and 9/22/06 have been considered except for the foreign document that has been crossed because no copy for that document is provided.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3, 9 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, 9 and 16, it is unclear if the recited range of 2 μ m to 30 mm refers to the length in a thickness direction of the flow channel or the length in the width direction of the flow channel. Also it is unclear if the recited range of .5 μ m to 1 mm refers to the length in a thickness direction of the narrow portion or the length in a width direction of the narrow portion. Since there are multiple lengths associated with the recited range, it is unclear if length or width is referred to thereby. Furthermore, since there is range that is common or overlapping range to both of the recited ranges, for example a range of 2 μ m to 1 mm, it would contradict the recited recitation that the narrow portion has a cross section that is smaller than that of the flow channel. Clarification is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 7, 8, 14, 15 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Gianchandani et al (US 6,686,998).

Gianchandani shows the method and apparatus claimed including a flow channel made of an insulation material having a narrow portion at latter portion of the flow channel with a smaller cross-sectional area than the flow channel, a conductive fluid in the fluid channel, an electrical field applied to generate plasma wherein the conductive fluid is sputtered or excited by the plasma created by electrodes that are arranged in the flow channel and are supplying an electric field thereto, and a light generated from the plasma is subject to the spectrometer analysis.

6. Claims 14, 15 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Platzer et al (US 6,381,014).

Platzer shows the apparatus claimed including a narrow portion in a flow channel made of an insulating material, the narrow channel having a cross-sectional area that is smaller than a cross-sectional area the flow channel, a pair of electrodes in the flow channel with the narrow channel sandwiched between the electrodes that generate an electric field thereto to generate a plasma in the narrow portion, and the narrow portion (20) which is shown as a separate single element is detachably arranged wherein the plasma generated is subject the spectrometer analysis. Platzer shows the narrow

portion has an opening that is less than .5 mm whereas an opening in the flow channel is .5 to 1 mm or above which shows the ratio of the cross-sectional of the flow channel to that of the narrow portion can be 3 or more. It is also noted that the recited conductive liquid is related as an intended material that is worked on by the apparatus which does not limit the apparatus claim. Also see MPEP 2115.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilding et al (US 7,018,830) in view of Columbus (US 4,302,313) or Duan et al (US 6,734,964).

Wilding shows a method and structure claimed including a detachably arranged narrow portion in a flow channel made of an insulating material wherein the narrow portion has a cross-sectional area having an order of .1 to 500 microns and with chambers with few millimeters which yields a ratio with the flow channel chambers to the narrow portion that is 3 or more. But, Wilding does not show applying an electric field to generate plasma at the narrow portion.

Columbus shows that it is known in the art to provide a pair of electrodes to a micro-channel with a conductive liquid to detect an electric potential based on the ions. Columbus also teaches that the channels or grooves can have dimensions that can be

varied depending on the desired rate of flow of a particular liquid. Duan also shows that it is known in the art to provide a plasma source to a pair of electrodes to generate plasma in a fluid sample and generate ions which are then detected with a spectrometer. Duan further shows it is known to provide a power discharge time of 100 us.

In view of Columbus and Duan, it would have been obvious to one of ordinary skill in the art to adapt Wilding with a pair of electrodes to supply an electric field in a single or multiple applications, which inherently bubbles, and to generate plasma or ions which are then detected by a spectrometer to determine and analyze the liquid samples as the liquid is migrated with an input and outlet port of the liquid.

With respect to the recited dimensions of the flow channel and the narrow channel, it would have been obvious to one of ordinary skill in the art to adapt Wilding, as modified by Columbus and Duan, with the recited dimensions or any other suitable dimensions that allow for a control desired flow that can be effectively ionized and generate plasma with the electrodes supplying the electric field as a matter of a routine experimentations.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SANG Y. PAIK whose telephone number is (571) 272-4783. The examiner can normally be reached on M-F (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on (571) 272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SANG Y PAIK/
Primary Examiner, Art Unit 3742